Technical Report 1194

Army Excellence in Leadership (AXL): A Multimedia Approach to Building Tacit Knowledge and Cultural Reasoning

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14. ABSTRACT *(Maximum 200 words)*:

This report presents findings from a preliminary examination of the Army Excellence in Leadership (AXL) system, a leader intervention that targets the development of tacit leadership knowledge and cultural awareness in junior Army officers. Fifty-five junior officers interacted with a pilot version of a cultural awareness module from the AXL system. Results indicated that the AXL approach resulted in improvements in leader judgment on a forced-choice measure. Furthermore, results indicated that cultural issues were more salient to leaders after completion of the cultural awareness module. Reactions to training were generally positive, with officers indicating that the cultural awareness module was useful and stimulated thought. Additionally, this investigation explored the relationship between affect and learning and found that emotional responses to the AXL system were related to learning-relevant variables, such as judgment scores and officer reports that they could apply the training to their activities as a leader.

15. SUBJECT TERMS

Leadership, TLAC-XL, AXL, Cultural Awareness, Tacit Knowledge, Training, Leader Development, Tripwire, Power Hungry

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Kim LeMasters wrote and produced the *Power Hungry* and *Tripwire* films included in the AXL.net system. Chuck Bowman directed *Power Hungry* and Kenny Johnson directed *Tripwire*.

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ARMY EXCELLENCE IN LEADERSHIP (AXL): A MULTIMEDIA APPROACH TO BUILDING TACIT KNOWLEDGE AND CULTURAL REASONING

EXECUTIVE SUMMARY

Research Requirement:

The current operating environment requires junior officers to rely upon diverse skills. Many junior leaders will encounter a wide spectrum of operations while deployed, and only a portion of those operations will draw upon their tactical expertise. Junior leaders may be required to engage in several non-tactical activities, such as interacting with the civilian population, building marketplaces, and negotiating with tribal leaders. This report describes a computer-administered leadership intervention called Army Excellence in Leadership (AXL), which was designed to help prepare junior Army officers for the complex challenges that they might encounter in the Middle East. This report describes preliminary research regarding the effectiveness of a cultural awareness module from the AXL system.

Procedure:

Fifty-five junior officers from three United States Army installations completed a cultural awareness module in the AXL system. The training module consisted of two primary components. First, small groups of officers watched a short filmed case study about a fictional mission in Iraq. Second, the AXL system facilitated small-group discussion of the cultural issues and implications embedded in the case study. Officers completed research measures at three time points during discussion: (1) before watching the film, (2) after watching the film, and (3) after completing discussion. Measures assessed various types of emotional reactions, reactions to the film, reactions to the training concept, and short-term indicators of learning.

Findings:

Results indicated that officers performed better on a judgment task after having completed training. Additionally, cultural issues embedded in the scenario were more salient to officers after completion of the cultural awareness module. With respect to different elements of the AXL system, findings indicated that the film was emotionally evocative and the training concept, in general, was well-received. Further, emotional responses to the film were related to learning-relevant variables, such as judgment scores and officer reports that they could apply the training to their activities as a leader.

Utilization and Dissemination of Findings:

This research provides preliminary evidence that the AXL system and the multimedia design principles that it embodies can assist junior officers develop culturally aware thinking. Instructors and trainers interested in helping officers acquire tacit knowledge can leverage some of these multimedia concepts to their advantage. This investigation also suggests that affect may play an important role in training and learning.

ARMY EXCELLENCE IN LEADERSHIP (AXL): A MULTIMEDIA APPROACH TO BUILDING TACIT KNOWLEDGE AND CULTURAL REASONING

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ARMY EXCELLENCE IN LEADERSHIP (AXL): A MULTIMEDIA APPROACH TO BUILDING TACIT KNOWLEDGE AND CULTURAL REASONING

Today's military operating environment is demanding and complex, requiring Army leaders to draw from skill sets that were unanticipated during the Cold War era. Indeed, it is not unusual for junior leaders (i.e., lieutenants and captains) to deal with circumstances that would have been handled by their senior leader counterparts twenty years ago. Many junior leaders will encounter a wide spectrum of operations while deployed, and only a portion of those operations will draw upon their tactical expertise. In addition to establishing local security and capturing insurgents, junior leaders may be required to engage in non-tactical activities, such as interacting with the civilian population, building marketplaces, and negotiating with tribal leaders. As Major General Scales noted,

> "Reflective senior officers returning from Iraq and Afghanistan are telling us that wars are won by creating alliances, leveraging nonmilitary advantages, reading intentions, building trust, converting opinions, and managing perceptions, all tasks that demand an exceptional ability to understand people, their cultures, and their motivation. While wars have become more complex, responsibility for those who fight them has increasingly slipped down the chain of command to junior personnel. Yet these young, inexperienced leaders have little time to prepare themselves to make strategic decisions" (2006, pg. 38).

Because the current operating environment places many demands on junior leaders, the United States Army has devoted substantial attention to the challenge of how to help junior leaders become adaptive thinkers, culturally aware, and interpersonally competent (e.g., Brown, 2003; Burpo, 2006; Moilanen & Craig, 2000; Petraeus, 2006; Scales, 2006). This paper describes a leadership intervention designed to prepare junior Army officers for the complex and chaotic situations that they will encounter in the Middle East and presents preliminary research regarding the effectiveness of the intervention prototype.

OVERVIEW OF THE ARMY EXCELLENCE IN LEADERSHIP (AXL) SYSTEM

The Army Excellence in Leadership (AXL) system is an online educational tool that targets the development of tacit leadership knowledge and cultural awareness in junior leaders. The AXL system is a variation of case method instruction in which junior leaders are presented with fictional case studies about military leadership in a tactical context and then asked to analyze, reflect on, and discuss the leadership issues embedded in the cases. The AXL approach to case method instruction differs from traditional case method instruction in at least two ways. First, traditional case method instruction often relies on paper-based cases. AXL cases are Hollywood-style films. Second, in the traditional case method approach, an instructor plays an essential role in facilitating discussion of the case. In AXL, the online system facilitates discussion among leaders and serves as a proxy for a human instructor. These two features of the AXL system are discussed in greater detail in the subsequent sections.

AXL Case Studies

The idea of using movies as case studies to demonstrate concepts or stimulate critical thinking is not new or unique (e.g., Cavalier & Weber, 2002; Green & Cotlar, 1973a; Leeper, 1993; Richardson, 1994; Sprau, 2001). Filmed case studies offer several advantages over traditional paper cases. First, paper cases require a certain level of reading proficiency, while film does not.

Second, film provides a multimedia experience that allows students to see and hear all of the events depicted in the case as if they were actually in the situation (Green & Cotlar, 1973b). Paper cases rely primarily on the reader constructing a mental representation of events based on written descriptions. When done correctly, film can achieve a higher level of fidelity to the performance environment than can a paper case. Film, therefore, can accomplish a level of immersion, complexity, and realism that might not be achieved by paper cases.

Third, a movie is an audiovisual experience containing dynamic visual images of situational context, depictions of character activity, spoken character dialogue, and background sounds. These attributes of film not only improve the fidelity of a student's experience; such attributes also might help students process case information more effectively than they would process the information contained in a paper case. Several lines of research on perception, memory, and learning provide strong evidence that individuals process verbal and visual information through two processing systems that operate somewhat independently of one another (e.g., Baddeley, 1986, 2003; Baddeley & Hitch, 1991; Gehring & Toglia, 1988; Holmes, Brewin, & Hennessy, 2004; Mayer, 2001; Mousavi, Low, & Sweller, 1995; Paivio, 1986, 1991). To grossly oversimplify—sounds are processed through one system and visible images are processed through another. Although limitations exist with respect to how much information each system can process individually, cognitive load as a whole can be reduced by presenting information in multiple modalities so that neither processing system is unduly overburdened. Mousavi et al. (1995) indicated that:

> "... [B]asic research into the characteristics of working memory has suggested that this processing system is divided into at least two partially independent processors: an auditory system devoted heavily to language and a visual system for handling images, including writing. Because both systems can be used simultaneously, limited working memory capacity might be effectively increased if information that must be stored or simultaneously processed is presented in a manner that permits it to be divided between the two systems, rather than processed in one system alone. As a consequence, informationally equivalent material that may be difficult to process in a purely visual manner may be more easily handled if it can be presented partially in both modalities" (pg. 331).

The two best known dual-processing theories are those of Paivio (1986) and Baddeley (1986). More recently, Mayer (2001) proposed a dual-processing theory of multimedia learning, which suggested that presentations using multiple modes of information transmission are superior to single mode presentations. Mayer's theory proposed that individuals process incoming information through two separate channels: a visual channel that registers images and an auditory channel that registers sounds. These two channels operate as distinct processing

systems, and they result in two separate knowledge representations—a verbal representation and a visual representation. In addition to the visual and verbal representations, individuals are able to form connections between the two knowledge representations, resulting in a coherent and elaborate representation of knowledge.

In sum, the accumulated body of research on dual-processing theories suggests that individuals are able to process and retain more information when multiple modalities are used than when only a single modality is used. A series of experiments conducted by Thompson and Paivio (1994) exemplifies this idea well. They found that recall was significantly higher when individuals were presented with both pictures of objects and their associated sounds rather than presented with only pictures or only sounds.

Within the context of AXL, leaders who watch the filmed cases are exposed to rich sources of both visual information and audio, and they may be more likely to retain this information than if they are exposed to the case information presented in a single modality. This improved probability of recalling relevant details from the multimedia scenario may, in turn, help to foster more profound and informative discussion about the case among students during the discussion phase of case method teaching.

The AXL system currently houses two filmed case studies, *Power Hungry* and *Tripwire.* Both *Tripwire* and *Power Hungry* are short films, lasting no longer than 15 minutes. The films were written, acted, directed, and edited by Hollywood professionals, resulting in high-quality films similar to those viewed in a movie theater. The first film, *Power Hungry,* was created for the AXL system in 2003. *Power Hungry* depicts a captain tasked with securing a site for a food distribution operation in Afghanistan. In addition to poor interpersonal skills and a lack of cultural awareness, the captain is confronted with warlords, terrain issues, time constraints, and inexperienced subordinates. The mission ends in failure, with an Afghan warlord seizing the food trucks. A still image from the *Power Hungry* film is presented in Figure 1.

Power Hungry centers around six teaching themes: understanding the mission, sharing vision, command influence, establishing a model of command, cultural awareness, and employing the expertise of non-commissioned officers (NCOs). Previous research on *Power Hungry* indicated that watching the film heightened the emotional arousal of junior leaders. The film also was more memorable and resulted in greater positive affect than the same case study presented in a multimedia PowerPoint format (Zbylut & Ward, 2004a; Zbylut, Ward, & Mark, 2005). The potential for film to engage students both cognitively and emotionally may benefit the learning process by helping students extract and retain important information from the lesson, as well as keeping students motivated throughout the lesson.

The second filmed case study, *Tripwire,* was completed in 2005. The *Tripwire* film is set in Iraq and the captain's mission is to arrange a meeting between two tribal leaders. In *Tripwire*, the Army battery encounters several obstacles to accomplishing its mission, including a fatal attack on an interpreter, insurgent activity, and improvised explosive devices (IEDs). *Tripwire* incorporates many of the same communication, leadership, and cultural issues embedded in *Power Hungry*, but includes additional themes, such as establishing trust with subordinates and taking care of Soldiers. A still image from *Tripwire* is presented in Figure 2.

Figure 1. In *Power Hungry*, an Afghan warlord expresses his displeasure to an American Soldier.

Figure 2. In *Tripwire*, American Soldiers interview their new interpreter.

Although many case studies are based on historical accounts of events that occurred, historical accuracy is not a necessary precondition for case study development. For example, Maltby (2001) noted that, "There are two possibilities when designing cases—to invent a situation, or to draw on a real one" (pg. 424). Similarly, Jennings (1996) indicated that "teaching cases may not be 'true' accounts of business life" (pg. 5), and suggested that other important criteria for determining the usefulness of a case study include how well the case stimulates discussion among students and how well the case engages a student intellectually and emotionally. What appears to be most important about a case is not necessarily that it is a true

account, but rather that it is realistic, complex, and built for accomplishing the teaching goals of the lesson. Along these lines, the films embedded in the AXL system are not historical accounts. Instead, the AXL films take an amalgam of real events and military issues to provide a rich, layered, and multifaceted stimulus for prompting student discussion about teaching points intentionally embedded in the stories. Both *Power Hungry* and *Tripwire* were built around content extracted from interviews with captains who had returned from recent deployments (Gordon, 2005; R. Hill, Douglas, Gordon, Pighin, & van Velsen, 2003; R. Hill, Gordon, & Kim, 2004). Challenges, problems, and situations that captains encountered while deployed were interwoven into the storylines of the films. To ensure that the films were realistic, subject matter experts (e.g., experts in military leadership, experts in IEDs) reviewed the film scripts prior to filming. Department of Army personnel were on location during filming to ensure military details were accurate.

Interactive AXL Modules

In traditional case-method teaching, an instructor guides student discussion and analysis of the case. Unfortunately, preparing for a case study can be both labor and time-intensive (Diamantes & Ovington, 2003), and many instructors may not have adequate time available to prepare. Additionally, the Army is seeking innovative ways to improve distance learning, which requires that appropriate online proxies for human instructors be developed. The AXL system seeks to address both of these challenges by providing online multimedia exercises that will prompt students to discuss and analyze the issues embedded in a case study without the aid of a "live" instructor.

Each film in the AXL system is paired with several interactive modules that address military leadership topics, such as cultural awareness, communicating with subordinates, and working with non-commissioned officers (NCOs). The modules were intended to be completed in small groups of two to four Soldiers. Junior leaders who wish to learn about a topic (or are told to learn about a topic by an instructor) select a module related to that issue. After selecting a topic, the AXL system presents the goals of the module to the group. The group then watches the associated filmed case on the computer. Once the group has watched the film, the AXL system automatically transitions into the discussion phase of instruction. A screen shot from an AXL online module is presented in Figure 3.

AXL facilitates discussion of the filmed cases by using a combination of close-ended and open-ended questions. The AXL system uses answers to close-ended questions to check for understanding of basic concepts, provide feedback, and branch the discussion to compel leaders to examine their thoughts and assumptions more closely. Open-ended questions are used to stimulate reflection and analytical thinking, encourage the sharing and application of real-world experiences, and generate solutions to problems in the case study. Another feature of the AXL system is that leaders can interview the main characters from a case study to ascertain what the characters knew, felt, and thought during the scenario. Leaders type questions into the AXL system to reveal a character's perspective on the scenario and uncover information not included in the film. Figure 4 depicts an example of a group querying a film character in the AXL system.

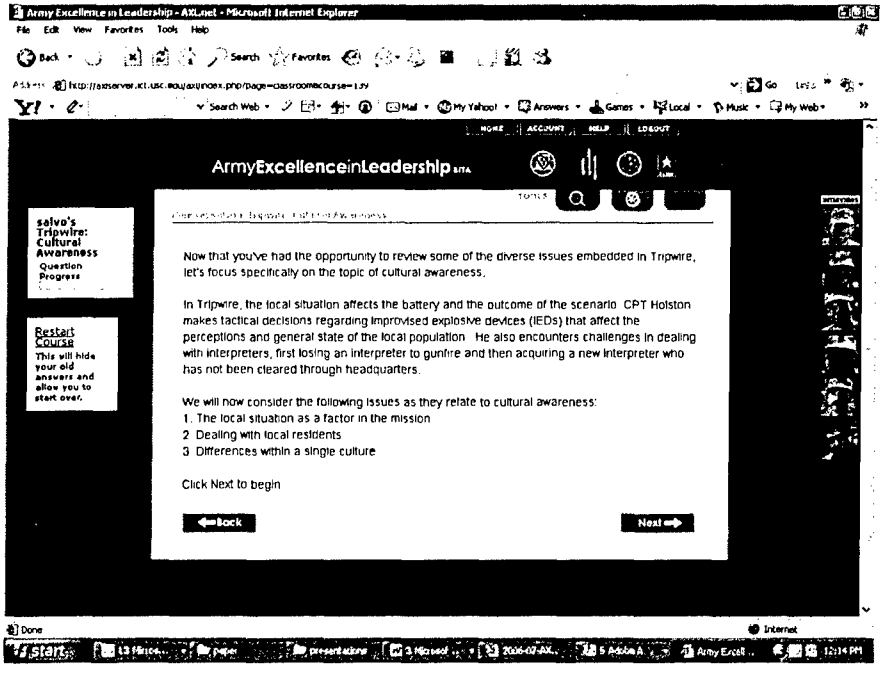

Figure 3. A screen shot from a Cultural Awareness module for *Tripwire*.

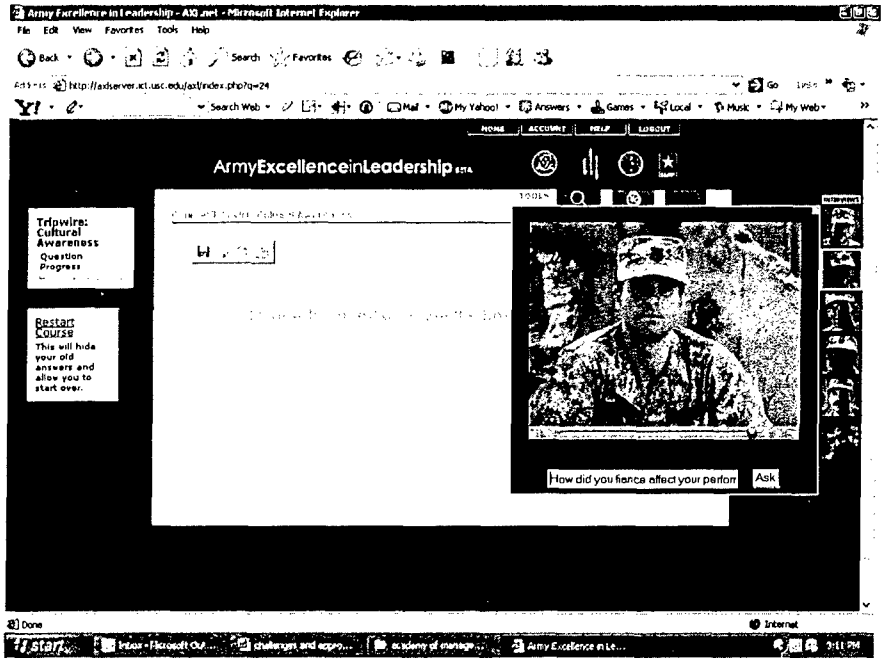

Figure 4. Example of a leader interviewing one of the characters from *Tripwire*. The leader types the question, "How did you fiancé affect your performance?" The character replies, "If you're asking *–was I bothered by finding out my girlfriend was pregnant?*—you bet I was. It was all I could think about. I mean, here I am a million miles away and she does what she did. But when the time came, I thought was ready. Wasn't I?" The character's answer corresponds to the leadership issue of *Taking Care of Soldiers*. Also note that minor grammatical errors, such as using "you" instead of "your," do not interfere with the relevance of the reply.

Theoretical Underpinnings of AXL

The AXL system design and pedagogical approach draws from a variety of research domains. First, AXL is a form of case method instruction, which is widely hailed as an effective approach for developing critical thinking, problem solving, and interpersonal skills (e.g., Crittenden, Crittenden, & Hawes, 1999; Hassall, Lewis, & Broadbent, 1998; Jennings, 1996; Kreber, 2001; Richardson, 1994; Stewart & Dougherty, 1993). AXL instruction includes realistic, multifaceted cases and focuses on helping leaders learn "how to think" rather than "what to think," thereby preparing leaders to deal with complexity when they encounter it in their work environment (Hannafin, J. Hill, & Land, 1997; Jonassen, 2002; Lesgold, 2001). Moreover, AXL's use of multimedia cases in conjunction with interactive multimedia modules can help leaders construct more elaborate and sophisticated knowledge representations than they would if information were presented using a single modality (Mayer, 2001; Mayer, Dow, & Mayer, 2003; Mayer & Sims, 1994; Moreno, 2006).

Second, AXL interactive modules build on several multimedia instructional design principles thought to promote active learning. Open-ended questions in AXL are used to encourage leaders to reflect, not only on various aspects of the case, but on how the case applies to their own personal experiences. The combination of personal experience and reflection helps to capture the leader's attention, as well as help the leader to integrate new information with past knowledge (Moreno, 2006). Open-ended questions in AXL also are closely linked to the pedagogical concepts of *elaborative interrogation* (e.g., Martin & Pressley, 1991; Pressley, McDaniel, Turnure, Wood, & Ahmad, 1987; Willoughby, Wood, Desmarais, Sims, & Kalra, 1997) and *self-explanations* (e.g., Chi & VanLehn, 1991; Mayer et al., 2003). During an AXL module, leaders are provided with multiple discussion questions that prompt them to examine the relationships among different elements in the scenario, reflect on the causal factors that may have influenced different events in the film, and consider the various implications of different courses of action that could have been adopted by characters in the scenario. By answering and discussing these types of questions (particularly questions about why certain events might have occurred and how group-derived explanations correspond to personal experience), leaders are better able to integrate new information they encounter during the module with previous experience and knowledge. These processes of self-explanation and elaborative interrogation can assist in retention of information over time, as well as generating inferences beyond the original material contained in the case.

Like open-ended questions, close-ended questions play an important role in the AXL system. While open-ended questions encourage leaders to think and actively construct knowledge, close-ended questions allow leaders to receive feedback, guidance, and more targeted lines of questioning. AXL uses close-ended questions to impose structure on an otherwise ill-defined task (i.e., make sense of a chaotic situation) and this imposed structure may be particularly helpful for novice leaders who do not possess well-developed schema that would help them process the information and issues embedded in a complex case (Moreno, 2006).

The opportunity to interview characters also builds on two multimedia instructional design principles: *interactivity* and *control*. The AXL capability to interview characters allows leaders to test hypotheses about why characters performed particular actions, thereby

encouraging "the processing of new information by engaging students in an active search for meaning" (Moreno, 2006, pg. 65). Moreover, the act of formulating a question to ask a character requires leaders to process information at a deep level; question-asking obliges leaders to direct their attention to specific content and monitor their level of comprehension with respect to that content (Rosenshine, Meister, & Chapman, 1996). Additionally, the character interview feature offers a certain degree of control to leaders. The discussion group must decide whether to interview characters, what to ask characters, and when to pose questions of characters. Allowing leaders to control when and if they want to interview characters may help to reduce cognitive load, thus helping leaders to attend to and process new information more effectively (Mayer et al., 2003).

A third domain of research that the AXL system draws from is research on tacit knowledge. The work of Sternberg and colleagues (e.g., Matthew, Cianciolo, & Sternberg, 2005; Sternberg, Forsythe, Hedlund, Horvath, Wagner, et al., 2000) indicates that leaders can acquire tacit (i.e., actionable) knowledge from reflecting on one's personal experiences, as well as the stories and experiences of others. During AXL instruction, leaders have the opportunity to reflect on multiple types of experiences. The first type of experience that leaders are exposed to in the AXL system is the fictional situation depicted in the film, and AXL modules require extensive reflection and analysis of the film. Leaders also examine a second type of experience in the AXL system—specifically, leaders are asked to examine their personal leadership experiences. In this instance, AXL presents leaders with the opportunity to think about their personal experiences in a different way than they typically would, examining similarities and differences between their personal experiences and the elements of the case. Leaders also have an opportunity to hear how peers respond to their personal experiences. A third type of experience that leaders are exposed to is the personal experiences of other discussion group members, and these experiences may or may not be similar to their own personal experiences. The comparison between one's personal experiences with the experiences of others and the situation depicted in the film might be particularly beneficial to learning because research suggests that comparing examples can assist in the development of problem-solving schema (see Anderson, Greeno, Kline, & Neves, 1981; Gick, 1986).

The AXL system is still in development, with a finalized system to be completed in 2007. The earliest version of AXL included only one film, *Power Hungry*, and one leadership module. Early research in the AXL project focused on collecting leader reactions to the product interface and content, and the primary goal of data collection was to examine media effects, gather information that would inform system design choices, and refine the pedagogical approach (Zbylut & Ward, 2004a; Zbylut et al., 2005). Based on those results a new version of AXL was delivered in 2006, with substantial changes to the AXL interface and flow of instructional events. The revised AXL system houses both the *Tripwire* and *Power Hungry* films, as well as several new instructional modules for each film.

Before testing the new AXL modules, the research team first showed *Tripwire* to small groups of lieutenants and captains ($N = 27$) at an Army installation in the Southwest. Researchers conducted focus groups and administered questionnaires to the officers to gather data about reactions to the film and to ascertain what leadership issues officers found to be

salient in the case study. Data from the questionnaires and focus group interviews were used to create measures to assess learning from *Tripwire* modules.

ARI then pilot tested one of the new AXL modules (a cultural awareness module for *Tripwire*) at three Army installations. The purpose of the investigation was to (a) collect reactions to the module and instructional approach, (b) assess whether the module impacted how leaders thought about the situation depicted in the film, (c) determine if learning occurred, and (d) explore whether emotional reactions were related to learning. The next section presents the method and results of that pilot investigation.

PRELIMINARY EVALUATION OF A CULTURAL AWARENESS MODULE FOR *TRIPWIRE*

Method

Participants and Procedure

Participants were 44 captains (CPTs), six first lieutenants (1LTs), and five second lieutenants (2LTs) from three United States Army installations. Twelve of the officers had deployed twice to the Middle East—11 to Iraq and one to both Iraq and Afghanistan. Thirty officers had deployed once to the Middle East—26 to Iraq and four to Afghanistan. The remaining 13 officers had not deployed to either Iraq or Afghanistan.

Each officer participated in a small discussion group for the cultural awareness module of *Tripwire*. Discussion group sizes tended to range from two to four junior officers, although one training session had one officer, and another training session contained seven officers.[1]

Prior to watching the film, officers completed a brief questionnaire asking them to report on their deployment experience and level of emotional arousal. Officers then watched *Tripwire* as a group on a laptop computer. After watching the film, officers independently completed a second set of measures. Once all of the officers completed the second set of measures, they began the discussion phase of the cultural awareness module. The module consisted of a series of open-ended and close-ended questions to prompt discussion about the cultural issues in *Tripwire*, particularly concerning the treatment of locals, managing the perceptions of locals, and dealing with IEDs in an urban environment. Discussion lasted approximately 45 to 90 minutes. Upon completing the cultural awareness module, officers independently completed a final set of measures. The entire process, including completion of measures, ranged from 90 to 120 minutes.

[1] Eight officers were originally scheduled to participate in two discussion groups consisting of four officers each, but three of the officers attended the wrong discussion group. This resulted in seven officers in one group, and one officer in another "group." The officer who completed the cultural awareness module by himself was told to reflect on the questions contained in the module. This individual had been deployed previously and presumably could draw from his experience while reflecting on the scenario.

Measures

Demographic Items

Prior to training, officers indicated their rank, how many times they had been deployed to Iraq, and how many times they had been deployed to Afghanistan.

Emotional Measures

Self-reported emotional arousal. Officers completed five self-report items that gauged their level of emotional arousal. These five items were part of Mehrabian and Russell's (1974) arousal scale and were anchored with bipolar adjectives on a nine-point scale ranging from -4 to +4. The bipolar anchors were relaxed/stimulated, calm/excited, sluggish/neutral, dull/jittery, and sleepy/wide awake. Arousal was operationalized as the mean of the five items. The arousal measure was given at three time points: immediately prior to watching *Tripwire* ($\alpha = .66$), immediately after watching *Tripwire* ($\alpha = .81$), and immediately after completing the cultural awareness training module ($\alpha = .74$).

Positive and negative affect. After watching the film and completing a measure of emotional arousal, officers completed the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Officers indicated the extent to which they experienced 20 emotions while watching the film. The 20 items were anchored on a five-point scale ranging from "very slightly or not at all" (1) to "extremely" (5). Positive affect ($\alpha = .91$) was the mean of 10 positive emotions, such as active, excited, and proud. Negative affect ($\alpha = .85$) was the mean of 10 negative emotions, such as hostile, upset, and distressed.

Reactions to the Film

After completing the PANAS, officers completed 15 items that addressed reactions that they had to the film. All of the items were anchored on a seven-point scale ranging from "strongly disagree" (1) to "strongly agree" (7). These items were completed prior to participating in discussion.

Character depth. Character depth was operationalized as the mean of six items that assessed perceptions about how believable and complex the characters in the film were ($\alpha = .78$). Examples of items from the scale were, "The story did a good job of communicating the thoughts, feelings, and emotions of the characters," "I can imagine meeting people similar to the characters presented in the story," and "I could identify with at least one character in the story."

Film involvement. Officers answered four items that assessed the degree to which they felt involved in the film's storyline. These items asked the extent to which officers wanted to find out what happened next in the story, whether the story was involving, and whether the story was suspenseful. An additional item, which was reverse-scored, asked officers if they were bored while watching the movie. Film involvement was operationalized as the mean of the four items ($\alpha = .79$).

Confusion. Confusion was assessed using the item, "I was confused about what was going on in the story."

Realism. Officers rated the extent to which they believed the story was realistic by using the item, "The story was realistic."

Preference for film over traditional instructional methods. Officers completed two items that assessed their preference for filmed case studies over traditional methods of instruction found in the Army. The first item was, "In an educational context, I would rather watch a film like this than read a scenario." The second item was, "In an educational context, I would prefer to discuss a film like this than listen to a PowerPoint briefing."

Reactions to AXL Training

After finishing the discussion phase of the cultural awareness module and the final measure of arousal, officers completed 16 items that addressed various reactions that they had to the AXL system. Items were anchored on a seven-point scale ranging from "strongly disagree" (1) to "strongly agree" (7).

Global reactions to training. Officers answered five items that assessed the perceived value of the AXL tool, ease of use, how informative the training was, how responsive the training was to the officer's educational needs, and how frustrating the training approach was (reverse-scored). A score for global reactions to the training was formed by computing the mean of the five items ($\alpha = .80$).

Stimulated thought. Because one of the objectives of case method teaching is to encourage critical thinking, four items assessed whether officers believed that the cultural awareness module made them think. These items were "The questions included as part of the training made me think critically about issues in the scenario," "This exercise made me think about what makes a leader effective," "This exercise made me think about what makes a leader ineffective," and "The training made me think about the scenario in a different way than I usually would." A score for this scale was calculated by computing the mean of the four items ($\alpha = .75$).

Character interactivity. Officers completed four items that addressed their reactions to the character interview features of the AXL system. These items were "Interviews with the characters gave me insight into why the mission failed," "I felt like the characters answered the questions that they were asked," "Interviews with the characters helped me understand why there was a breakdown in communication between different characters," and "I liked that the actors stayed 'in character' when they answered my questions." A score for this scale was calculated by computing the mean of the four items ($\alpha = .81$).

Applicability of training. Officers completed a single item, "I can apply some of the things that I learned here to my activities as a leader," which was used to assess whether officers believed they would transfer knowledge gained during the AXL module to their job.

Wanted feedback. In order to assess whether officers believed the AXL system should provide more feedback, officers indicated the extent to which they agreed with the following item: "I wanted more feedback about how I was doing during the training modules."

Learning

One challenge to assessing whether learning occurred during AXL instruction is that the AXL case method approach adopts a constructivist view of learning. According to the constructivist paradigm, meaningful learning occurs when individuals construct their own interpretations of the world. Moreover, multiple valid interpretations of the world are not only possible, but expected (Dalgarno, 2001; Hannafin et al., 1997; Mayer, 1996). In this respect, discussing a case study is largely a sensemaking process in which groups of leaders share experiences and thoughts to derive a greater understanding about leadership than they had prior to discussion. Given that the content and outcomes of different discussion groups may have significant variability across groups, a primary challenge for the researcher is how to objectively measure whether discussion was worthwhile. That is, if different leaders are learning different, but valid things, how does one measure learning?

While leaders from any one discussion group may discuss different information and ultimately arrive at different "wisdom" than leaders from another discussion group, the tenets of constructivism clearly imply that individuals who engage in knowledge construction activities (like discussion) should experience a change in their understanding or interpretation of events. Additionally, if the researcher has a sense of what common themes or topics will emerge in different discussion groups, the researcher can compile a heterogeneous set of learning items that will likely tap at least a few of the topics brought up during any one discussion.

Learning in this investigation was assessed using two different approaches. The first approach utilized a rank-ordering task to assess whether leaders experienced a change in their understanding of the importance of cultural issues embedded in the case study. The second approach used a series of forced-choice items to examine whether leaders demonstrated better judgment after completing the cultural awareness module. While the first approach provided an indicator of how a leader was framing issues and content embedded in *Tripwire*, the second approach provided an indicator that the leader applied knowledge learned during discussion to problems embedded in *Tripwire*.

Emphasis on cultural issues. As mentioned previously, an earlier data collection effort used focus groups and written questionnaires to explore the leadership issues junior officers believed were important in *Tripwire*. During that investigation, officers indicated what they would have done differently if they were a Soldier in the *Tripwire* scenario. From this data, a list of 21 issues was compiled.[2]

[2] The initial list consisted of 92 character actions discussed or written about during focus group sessions. Actions having significant overlap were combined, resulting in a list of 47 items. Because rank ordering 47 issues would be cognitively overwhelming for participants, the list was reduced to the 28 most commonly mentioned issues. A rank-ordering task with these 28 items was piloted at one of the three Army installations during data collection. Analysis of the first administration of the measure indicated that some issues were selected infrequently, and seven issues were removed from the measure to make the ranking task less cognitively demanding. Thus, the finalized ranking task of 21 items was administered at only two of the three installations, resulting in $n = 36$ on this measure.

Eight of the 21 issues appeared as discussion topics in the cultural awareness module. These issues not only reflected decisions and actions that could influence Iraqi behavior and perceptions of the Army, but also included issues that required knowledge about cultural antecedents and consequences surrounding events in the scenario. Cultural issues included somewhat evident cultural topics such as, "CPT Holston should have refrained from shooting the backpack with the Koran" and "1LT Porter should have refrained from striking the second interpreter," as well as less apparent cultural topics such as, "CPT Holston should have investigated why the first interpreter was shot."

The 21 issues were used in a rank-ordering task designed to measure a leader's understanding of what issues he or she believed were most important in the film. In the rank-ordering task, officers were asked to select the top seven actions that Soldiers in the film should have done differently. Officers were then asked to arrange those top seven actions from most important to least important. Officers received one point for each cultural issue that they ranked among their top seven most important issues.

Officers completed the rank ordering task twice—once after watching the film (but before discussion) and once after discussion. The 21 issues were arranged in different orders for the two time points. The ranking task was used to examine whether officers deemed the cultural issues to be more important after discussing the scenario.

Behavioral judgment. In addition to the ranking task, leaders completed eight items that asked them to choose between two courses of action that could have been taken during the *Tripwire* scenario. The forced-choice items represented a heterogeneous set of issues intentionally embedded in the case study, including maintaining one's health versus self-sacrifice for the mission, accomplishing the mission versus protecting one's Soldiers, listening to the advice of Soldiers versus maintaining command authority, and neutralizing potential IED threats versus offending Iraqi civilians. For each item, a leader received one point if he or she selected the better course of action (i.e., consistent with the teaching goals built into *Tripwire*). A behavioral judgment score was then computed by summing across the eight items. Items and response options were randomly arranged for both the pretest and posttest. Additionally, one of the "pretest" items was given prior to watching the film because it did not require watching the film to answer the question. Two examples of forced-choice items are provided. The "correct" answers are denoted by an asterisk.

> During the planning meeting, the platoon leaders told CPT Holston that they should be conducting "rolling Ts" in the town in order to keep things calm until the VIP's arrival. After the first interpreter was killed, CPT Holston's Soldiers again indicated that they believed a more aggressive stance should be taken in the town. Do you believe that it is more important for CPT Holston to...
>
> a. Maintain his initial restrained stance, especially given that his junior officers are challenging him.
>
> b. Act on the advice of his subordinates, even if they are challenging his authority.*

In general, it is better for a leader to...

a. Put mission tasks ahead of physical well-being (e.g., skipping meals, reducing sleep time) in order to get the job done.

b. Take time out to sleep, eat, and hydrate, even if it takes some time away from important mission-related tasks.*

Results

Participant Reactions

The means and standard deviations for the measures used in this investigation are presented in Table 1. Results indicated that reactions to the film were positive, with officers rating the film as involving ($M = 5.55$, $SD = 1.03$) and characters as complex ($M = 5.35$, $SD = .93$). In general, officers tended to view the film as realistic, although substantial variability existed among leaders ($M = 4.96$, $SD = 1.71$). Regardless of whether the film was perceived as realistic, officers overwhelmingly preferred watching a film to reading a scenario ($M = 6.60$, $SD = .81$) or listening to a PowerPoint presentation ($M = 6.76$, $SD = .58$).

Reactions to the AXL training package overall also tended to be positive. Officers' global reactions to the training were positive ($M = 5.64$, $SD = .85$), and officers indicated that the cultural awareness module was thought provoking ($M = 5.39$, $SD = .82$). Likewise, officers indicated they could apply something that they learned during the module to their activities as a leader ($M = 5.56$, $SD = 1.18$). Officers were somewhat neutral with respect to whether they believed the AXL system should provide more feedback ($M = 3.45$, $SD = 1.71$), with some officers wanting substantially more feedback than others. The character interview features received slightly positive ratings ($M = 4.53$, $SD = 1.23$), but ratings suggest that the character interview functionality in the system needs improvement.

Learning

Emphasis on Cultural Issues

A paired-samples t-test was conducted to examine if officers placed stronger emphasis on cultural issues after completing the cultural awareness module. Results indicated that officers ranked more cultural issues as important after participating in discussion ($M = 3.11$ issues, $SD = 1.39$) than before discussion ($M = 2.64$ issues, $SD = 1.17$), $t(35) = 2.50$, $p < .05$. This finding provides evidence that the cultural awareness module resulted in a conceptual shift in officer understanding of the situation depicted in the *Tripwire* scenario, such that officers viewed cultural issues as significantly more important after completing the cultural awareness module.

Table 1

Means and Standard Deviations of Variables (N = 55)

	M	*SD*
Reactions to the Film		
Character Depth	5.35	.93
Involving Film	5.55	1.03
Confused	1.78	.92
Realism	4.96	1.71
Preference for Film over Text Scenario	6.60	.81
Preference for Film over PowerPoint	6.76	.58
Reactions to Training		
Global Training Reactions	5.64	.84
Stimulated Thought	5.39	.82
Character Interactivity	4.53	1.23
Training Applicability	5.56	1.18
Wanted Feedback	3.45	1.71
Learning		
Behavioral Judgment Pretest	4.82	1.22
Behavioral Judgment Posttest	5.08	1.30
Emphasized Cultural Issues (Post-film) [a]	2.64	1.17
Emphasized Cultural Issues (Post-training) [a]	3.11	1.39
Emotional Measures		
Arousal (Pre-film)	-.47	1.13
Arousal (Post-film)	.80	1.30
Arousal (Post-training)	.20	1.10
Positive Affect	3.03	.85
Negative Affect	1.82	.67

Note. Measures included in the *Reactions to Film* and *Reactions to Training* categories are based on a 7-point scale ranging from "strongly disagree" to "strongly agree." Within the *Learning* category, the highest possible score that could be achieved was 8 for the behavioral judgment test and 7 for the Emphasis on Cultural Issues task. With respect to the *Emotional Measures* category, self-reports of arousal were on scale ranging from -4 to +4, with positive scores indicating arousal and negative scores indicating lethargy. Positive and negative affect were measured on a 5-point scale with higher scores indicating stronger affect.

[a] $n = 36$

Changes in Behavioral Judgment

A paired-samples *t*-test also was used to examine whether discussing the film resulted in better judgment by leaders. Results indicated that officers tended to exhibit better judgment about behavioral courses of action after discussion ($M = 5.08$, $SD = 1.30$) than they did before discussion ($M = 4.82$, $SD = 1.22$), $t(54) = 2.08$, $p < .05$. Thus, the cultural awareness module appears to have impacted leaders' judgment in a way consistent with the teaching goals of the *Tripwire* case study.

Emotional Response to the Training

A repeated measures analysis of variance (ANOVA) indicated that self-reported levels of arousal changed at different points during the cultural training, $F(2, 108) = 25.99$, $p < .001$. Paired-samples *t*-tests were conducted to compare the three time points to examine the nature of these differences. Results indicated that arousal was lowest prior to watching the film ($M = -.47$, $SD = 1.13$), being significantly lower than arousal levels reported immediately after the film ($M = .80$, $SD = 1.30$), $t(54) = -6.33$, $p < .001$, and after the training ($M = .20$, $SD = 1.10$), $t(54) = -4.04$, $p < .001$. In general, arousal was highest immediately after watching the film, with arousal weakening slightly during the course of discussion, $t(54) = 3.76$, $p < .001$. The pattern of arousal throughout the training is depicted in Figure 5.

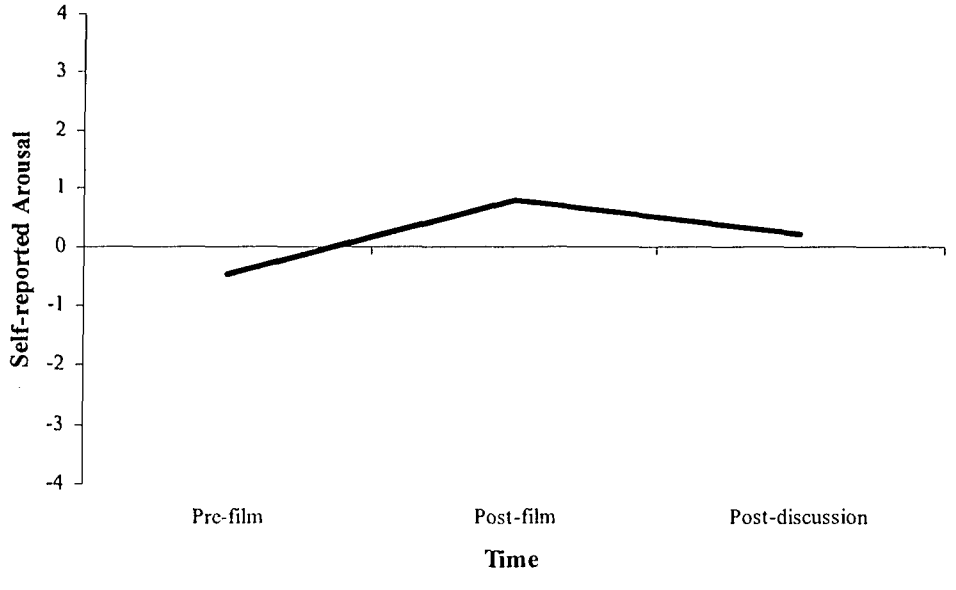

Figure 5. Reported Arousal over the Course of the Training Intervention

These results suggest that the training is emotionally engaging, with the film being particularly arousing. However, while the arousal measure provides an indicator of the energizing component of emotion, it does not provide an indicator of the valence (i.e., pleasantness) of emotion. Affect consists of two important elements: level of activation (i.e.,

arousal) and hedonic relevance (Feldman, 1995; Russell, 2003). With respect to *Tripwire*, it was unclear whether the film would be received as a pleasant or an unpleasant experience. In one respect, the film could generate positive affect, because the film might prompt the interest, attention, and excitement of the viewer. Conversely, the unpleasant situation depicted in the film could prompt a negative experience, generating feelings of anger, hostility, and distress. A paired-samples *t*-test was conducted to examine whether the film evoked more positive versus negative affect. The *t*-test indicated that the film evoked greater levels of positive affect (M = 3.03, SD = .85) than negative affect (M = 1.82, SD = .67), $t(54) = 11.62$, $p < .001$.

Relationships between Emotions and Learning

One of the purposes of this investigation was to explore the relationship between emotions and learning. Of note is how emotional measures correlated with other measures (see Table 2). While arousal levels were not significantly related to any learning variables, affect was related to several learning-relevant variables. Positive affect was positively correlated with the behavioral judgment posttest score ($r = .33$, $p < .05$) but was uncorrelated with the behavioral judgment pretest score ($r = .10$, $p = ns$), suggesting that positive affect experienced during the film may be related in some way to what an individual learns during the course of discussion. Positive affect also was related to global reactions to the training ($r = .43$, $p = .001$), and both positive affect and negative affect were related to how thought-provoking the training was (positive affect: $r = .31$, $p < .05$; negative affect: $r = .44$, $p = .001$), and whether leaders believed they learned anything that could be applied to their work (positive affect: $r = .43$, $p = .001$; negative affect: $r = .31$, $p < .05$).

Results with respect to the relationship between affect and emphasis on cultural issues were more difficult to interpret. Neither positive affect ($r = .26$, $p = ns$) or negative affect ($r = .21$, $p = ns$) were significantly related to emphasis on cultural issues after the discussion. However, positive affect was significantly correlated with how much officers emphasized cultural issues *prior* to discussion ($r = .44$, $p < .01$). Thus, officers who experienced more positive affect during the film appeared to focus their attention on culturally relevant courses of action before discussion with other officers, but the relationship between positive affect and emphasis on cultural issues was weaker after participating in discussion.

Several other correlations are worth noting. First, an officer's level of engagement with the film might have bearing on how well that individual learns from the training. Officers who found the characters to be complex and believable tended to score higher on the judgment posttest than officers who did not rate the film characters highly ($r = .30$, $p < .05$). Additionally, officers who rated the film as involving tended to score higher on the judgment posttest than officers who did not rate the film as involving ($r = .35$, $p < .01$).

Second, unanticipated relationships were found between pre-film arousal levels and reactions to both the film and training. Officers who reported higher levels of arousal prior to watching the film also reported higher levels of confusion about what was happening in the film ($r = .29$, $p < .05$) and wanted to receive more feedback during training ($r = .30$, $p < .05$). Officers with higher levels of arousal prior to watching the film also tended to indicate that they did not prefer film to a PowerPoint briefing ($r = -.36$, $p < .01$).

Table 2

Correlations among Measures (N = 55)

	Arousal (Pre-film)	Arousal (Post-film)	Arousal (Post-training)	Positive Affect	Negative Affect	Character Depth	Involving Film	Confused	Realism	Film v. Text	Film v. PowerPoint
Emotional Responses											
Arousal (Post-film)	.25										
Arousal (Post-Discussion)	.38**	.52**									
Positive Affect	-.10	.45**	.24								
Negative Affect	-.11	.28*	-.02	.50**							
Reactions to Film											
Character Depth	-.14	.25	.06	.58**	.33*						
Involving Film	-.13	.30*	.07	.56**	.36**	.78**					
Confused	.29*	.18	.32*	-.07	.05	-.20	-.07				
Realism	-.12	.24	.10	.36**	.28*	.69**	.65**	-.14			
Film v. Text	-.24	-.01	-.07	.33*	.24	.47**	.39**	-.30*	.33*		
Film v. PowerPoint	-.36**	-.01	-.16	.43**	.34*	.53**	.46**	-.31*	.27*	.83**	
Reactions to Training											
Global Training Reactions	-.18	.23	.06	.43**	.26	.69**	.72**	-.16	.60**	.44**	.42**
Stimulated Thought	-.15	.13	-.10	.31*	.44**	.44**	.46**	-.13	.30*	.33*	.39**
Character Interactivity	-.20	.01	-.05	.12	.26	.50**	.39**	-.18	.51**	.36**	.31*
Applicability	-.13	.14	.09	.43**	.31*	.69**	.77**	-.00	.47**	.31*	.34*
Wanted Feedback	.30*	.15	.07	.04	.01	-.09	-.18	.14	-.21	.03	-.10
Learning											
Emphasized Cultural Issues (Post-film) [a]	.26	.31	.27	.44**	.30	.29	.12	-.15	.06	-.12	.03
Emphasized Cultural Issues (Post-discussion) [a]	-.13	-.01	-.16	.26	.21	.12	.13	-.05	-.08	-.04	.25
Behavioral Judgment Pretest	.05	.14	-.05	.10	.05	.26	.37**	.20	.20	.08	.07
Behavioral Judgment Posttest	-.10	.19	-.07	.33*	.13	.30*	.35**	-.06	.26	.19	.20

Note. * $p < .05$, ** $p < .01$

[a] $n = 36$

Table 2 (continued)
Correlations among Measures (N = 55)

	Global Reactions	Stimulated Thought	Character Interactivity	Applicability	Wanted Feedback	Emphasized Cultural Issues (Post-film) [a]	Emphasized Cultural Issues (Post-discussion)[a]	Behavioral Judgment Pretest
Reactions to Training								
Stimulated Thought	.66**							
Character Interactivity	.54**	.48**						
Applicability	.75**	.50**	.45**					
Wanted Feedback	-.06	-.01	-.15	-.09				
Learning								
Emphasized Cultural Issues (Post-film) [a]	.12	-.13	.05	.30	.11			
Emphasized Cultural Issues (Post-discussion) [a]	.19	.02	.00	.23	-.17	.61**		
Behavioral Judgment Pretest	.17	-.03	-.01	.36**	-.06	-.02	.04	
Behavioral Judgment Posttest	.28*	.07	-.07	.33*	.04	.11	.14	.74**

Note. * $p < .05$, ** $p < .01$
[a] $n = 36$

DISCUSSION

The results of this investigation indicated that the case study approach adopted in the AXL system holds promise in shaping the knowledge and judgment of Army leaders. Specifically, after completing the cultural awareness module, leaders exhibited better judgment about various behavioral courses of action that could have been adopted in the *Tripwire* scenario. The cultural awareness module also appeared to play a role in influencing the importance leaders placed on the cultural issues in the film, with leaders placing stronger emphasis on cultural issues after having completed the module. These findings are consistent with research on tacit knowledge that suggests individuals can develop tacit knowledge by reflecting on their experiences and the experiences of others (Cianciolo, Anotonakis, & Sternberg, 2004; Matthew et al., 2005; Sternberg et al., 2000).

Findings with respect to reactions to the *Tripwire* film were both encouraging and similar to findings for the *Power Hungry* film (Zbylut & Ward, 2004a; Zbylut et al., 2005). Officers rated *Tripwire* as involving and the characters as multi-layered. Moreover, officers found the film to be fairly realistic and were not confused by the film. Indeed, officers overwhelmingly indicated that they would prefer to watch a film rather than read a case study or listen to a PowerPoint presentation, both of which are common instructional techniques used in Army education. These results indicate that the two films are an appropriate way for depicting case study material in the AXL system.

In addition to positive reactions to the film, officers responded positively to the AXL cultural awareness module as a whole. Officers rated the AXL cultural module as valuable and useful. More importantly, officers indicated that they would be able to transfer something that they learned to their activities as a leader. Furthermore, officers reported that the module was thought-provoking—not only compelling them think about what makes a leader effective versus ineffective, but helping them to think about the *Tripwire* scenario in a different way than they usually would. Taken as a whole, the results of this investigation support some of the basic tenets of case method teaching; namely, case method teaching challenges the assumptions of students and stimulates critical thinking (e.g., Crittenden et al., 1999; Jennings, 1996; Kreber, 2001; Richardson, 1994; Stewart & Dougherty, 1993).

This investigation also explored the relationship between emotions and learning. One of the long-term goals of the AXL project is to examine if film is emotionally evocative and whether this has any long term benefits for learning and behavior over time. Previous research regarding AXL indicated that the first film, *Power Hungry*, led to heightened emotional arousal and reports of positive affect (Zbylut & Ward, 2004a; Zbylut et al., 2005), and results found for *Tripwire* replicate those findings. While the present investigation did not examine the long-term impact of emotionality on learning and retention, results indicated a positive relationship between positive affect and behavioral judgment posttest scores. Moreover, both positive affect and negative affect were related to several self-report measures indicative of learning—specifically, how much leaders reported that the training stimulated thought and the extent to which leaders could transfer knowledge to the work environment. Due to the design of this research, it is unclear whether affect played a role in learning or was just a byproduct of the film medium. However, a growing body of work on mood, affect, and arousal support the notion that

emotions play an integral role in learning. For example, Murray, Harish, Hirt, and Sujan (1990) found that individuals in positive moods demonstrated enhanced cognitive flexibility and had greater access to diverse and unusual information than individuals in neutral moods. Both cognitive flexibility (i.e., being able to identify similarities and differences between stimuli) and access to novel information would likely enhance case method discussion because they increase the probability that leaders will (1) bring unique perspectives to group discussion, and (2) be able to compare, contrast, and ultimately integrate those differing perspectives, resulting in new knowledge. Like positive affect, negative affect might play a productive role in learning from case studies because negative moods may trigger a desire to process information more deeply and to think more analytically (George, 2000; Sinclair, Mark, & Clore, 1994). The results of the present investigation are consistent with the proposition that negative affect is related to thinking in that officers who reported experiencing negative affect during the film also tended to report that the cultural awareness module was thought-provoking. However, negative affect did not significantly correlate with the behavioral judgment posttest, which is another indicator of critical thinking.

It is worth noting that the measure of positive affect used in this investigation included several items that measured emotions that could be considered conducive to the learning process (e.g., alert, attentive, enthusiastic, and interested). One explanation for why learning measures and positive affect were correlated is that leaders who experienced positive affect might have paid better attention to the details of the film, and leaders were then able to bring more film content into discussion and analysis during their discussion groups. The unexpected correlation between positive affect and emphasis on cultural issues *prior* to discussion of the film may serve as evidence to support that claim. Prior to watching the film, leaders were informed that they would be completing a module on cultural awareness, so it is possible that leaders who were more alert and attentive tended to focus more on the cultural issues in the film. As a result, individuals who experienced greater positive affect also tended to place greater weight on cultural content during the ranking task. Unfortunately, the data collection design used in this research does not merit such causal interpretations, and the correlation between positive affect and emphasis on cultural issues is based on a relatively small sample size.

Another potential explanation for the relationship between positive affect and learning could be that leaders carry over the positive affect that they experienced during the film and then brought that energy and enthusiasm to the discussion. Further research is necessary to explore the potential mechanisms by which positive affect, negative affect, and other emotional variables may benefit or harm the learning process, particularly in the context of group discussion. One line of inquiry that might stimulate research on how emotions impact group discussion is the work on emotional contagion, which suggests that individuals can infect others with their mood (Barsade, 2002; Gump & Kulik, 1997; Howard & Gengler, 2001; Pugh, 2001; Sy, Cote, & Saavedra, 2005).

In sum, the findings of this research are especially encouraging given that many of the leaders who participated have significant deployment experience, and yet still appeared to learn something new from the AXL cultural awareness module. Moreover, the AXL system delivers an online format for conducting effective case method instruction without requiring intervention from an instructor. Such a format reduces demands on instructor time in the form of lesson

preparation and helps to deliver interesting educational content in an online learning environment. The AXL system, however, is flexible with respect to allowing instructors to be as involved in instruction as they wish to be. While instructor involvement is not required to administer AXL modules, instructors can use AXL films to conduct their own class discussions around whatever topics they choose (Zbylut & Ward, 2004a, 2004b). Additionally, the finalized AXL system will allow instructors to create their own online modules around either of the two existing films or upload new text-based or filmed case studies into the AXL system's library.

Challenges in Evaluating AXL Research

Research on the AXL system is ongoing, with some of the most important evaluation events to occur in a longitudinal investigation scheduled for 2007. Although the results of this pilot investigation were encouraging, this research examined only one of the several AXL modules currently available. While findings provided evidence that the cultural awareness module is a useful instructional tool, the AXL intervention as a whole consists of two case studies and multiple leadership modules. Our expectation is that the most meaningful learning occurs, not from a single module, but from discussion of multiple topics across the different situations depicted in the two filmed case studies. Moreover, it is unclear from this investigation how long the effects in learning will last over time, or whether leader behavior and judgment has permanently changed as a result of the intervention.

The biggest obstacle to evaluating AXL instruction has been access to sufficient numbers of Army officers for sufficient periods of time. Given the frequency of deployments to both Iraq and Afghanistan, the typical pool of leaders available to participate in research is greatly reduced. Moreover, when leaders are stateside, they are busy preparing their units for the next deployment and do not have time to participate in research, particularly if the finalized training intervention is not yet available. Additionally, administering the entire AXL intervention (both films and a minimum of four modules) would require a large time commitment from Soldiers, taking valuable time away from other important leadership activities.

The researchers have, therefore, adopted an iterative evaluation process to test various components of the AXL system at a time. When the first beta-version of AXL was produced, the researchers examined differences due to media effects (Zbylut & Ward, 2004a; Zbylut et al., 2005). Testing for media effects allowed the researchers to conduct studies that required a limited number of research participants for a few hours. This permitted the researchers to observe how leaders discussed an AXL case study when an instructor was not present, as well as gather reactions to different modes of presenting the material. Observations were then used to refine the AXL interface and make modifications to the pedagogical approach. In sum, the first wave of data collection primarily targeted usability issues, media effects, and reactions to the AXL approach.

The results reported in this paper represent the second iteration of AXL evaluation. This second wave of data collection focused on gathering reactions to the revised AXL approach, assessing learning within the context of a single AXL module, and exploring the relationship between emotions and learning. Similar to our previous experience, only a limited number of leaders were available for participation and only two-and-a-half hours were allotted for data

collection. Given the time constraints and the desire to have a sample large enough to conduct statistical tests, the researchers chose to focus evaluation efforts on a single AXL module and evaluate learning within the constraints of a short-term context.

Evaluating learning within a short-term context presented a research challenge for this particular project. Although a portion of AXL interactive modules is devoted solely to the analysis of the film, the AXL system also requires that leaders reflect on and discuss their personal experiences and make comparisons between their experiences and the film. Moreover, it is likely that the sharing and discussion of these leadership experiences is one of the more valuable aspects of the AXL system (Palus, Horth, Selvin, & Pulley; 2003; Zbylut & Ward, 2004a). Unfortunately, since each leader's experience is unique and group dynamics can take a discussion in a multitude of different directions, it is difficult to predict precisely what "pearls of wisdom" leaders will extract from AXL instruction.

We dealt with the challenge of assessing learning in a short-term context in a few different ways. The simplest approach was to gather self-reports of learning. We asked leaders to indicate whether the instructional approach was thought-provoking and also if they would be able to transfer something that they learned to their activities as a leader. The other two approaches used to assess learning were a rank-ordering task and a set of forced-choice items targeting judgment. Both of these approaches required us to conduct a preliminary data collection effort in order to ascertain what issues the target training audience found salient and what courses of action the target training audience thought were appropriate in the Tripwire scenario. While all of these short-term approaches taken together provide an indication that the AXL system holds promise, the primary question that remains unanswered is how the approach impacts general knowledge and leader behavior over time. Access to sufficient numbers of officers in a longitudinal context is required to answer that question.

Concluding Remarks

Practitioners interested in the delivery of online leader development tools can easily leverage many of the techniques applied in the AXL system. Specifically, using multimedia case studies, particularly in film format, appears to capture leader attention and evoke emotion. Moreover, a computer can be used to facilitate the group discussion process through the use of open-ended questions that target analysis of the case study and reflection on personal experiences. Close-ended questions can be used to branch discussion along different lines of thought and provide feedback to individuals to exert quality control over the discussion. This paper provides evidence that online instructional tools can be both interesting and educational.

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